

Appln. No. 09/681,891

Attorney Docket No. 13378-136

REMARKS

Reconsideration and re-examination of this application in view of the above amendments and the following remarks is herein requested. Claims 14 and 16-46 are pending in the application. Claims 1-13 and 15 have been cancelled. Claims 27-46 have been added. Claims 14, 16-18, and 24-25 have been amended. Support for the above amendments and new claims is found in Applicants' specification as originally filed.

In the Drawings

The Examiner has indicated that the drawings are objected to, but has not indicated the correction that is required. Applicants respectfully request that the Examiner particularly point out his objections to the drawings so that the appropriate corrections may be implemented.

Rejections under 35 U.S.C. § 112 ¶ 2

Claims 24-26 stand rejected under 35 U.S.C. § 112 ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended these claims in accordance with the Examiner's suggestions to clarify these claims. Entry of these amendments is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 14-17, 20, 25, and 26 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Pat. No. 4,404,237, issued to Eichelberger et al.

BRINKS
HOFER
GILSON
ALONE

Appln. No. 09/681,891

Attorney Docket No. 13378-138

(Eichelberger). This rejection is respectfully traversed, except with regard to claim 15, which has been canceled.

Independent claim 14, from which claims 16-17, 20, 25, and 26 depend, is directed toward a method of manufacturing a thick film heater. Claim 14 is currently amended to include the steps of: applying the heating element to the surface of the target object, thermally curing the heating element for a first period of time in a standard curing cycle, sealing the heating element with a dielectric layer, and thermally post-curing the heating element and the dielectric layer for a second period of time in a post-curing cycle, the second period of time being longer than the first period of time. The heating element comprises a thick film resistive circuit comprising polymer-based ink.

Eichelberger discloses a low cost conductor (Abstract). Polymer conductors, comprising an ink composition, are applied to a substrate and dried, and cured if desired (Col. 10, lines 39-44). Next, a polymer resistor is printed or otherwise placed on the substrate in a conventional fashion such that the resistor overlaps the conductor ink pattern at least in some areas (Col. 10, lines 44-48). The polymer resistor ink is dried, and cured if desired (Col. 10, lines 48-49). Then, an insulating coating material is applied and cured (Col. 10, lines 49-54). If an autocatalyst has been added, the polymer will cure by itself with no additional initiation (Col. 7, lines 14-15). A thermal curing system is preferred, wherein the polymer is exposed to temperatures of about 140 °C – 200 °C, for a time of about 0.1 – 1 hour (Col. 7, lines 19-22). More preferably, the polymer is cured at about 150 °C – 180 °C for a time period of about 0.15 – 0.5 hour (Col. 7, lines 22-23).

Eichelberger fails to disclose a method of manufacturing a thick film heater having the steps of thermally curing the heating element for a first period of time, and

BRINKS
MOFFER
GILSON
ALONE

Appln. No. 09/681,891

Attorney Docket No. 13378-138

thermally post-curing the heating element and the dielectric layer for a second period of time that is longer than the first period of time. With regard to periods of time, Eichelberger discloses only the period of time for curing the ink polymer, which ranges from 0.1 – 1 hour, and Eichelberger's preferred period of time for curing the polymer does not exceed thirty minutes. Eichelberger does not give a period of time in which the dielectric and resistive layers are cured together, and this omission certainly does not teach curing the heating element and dielectric layer for a second period of time that exceeds the first period of time in which the ink polymer was cured without the coating material. Further, the drying step is not a thermal curing step, and claim 14 requires both a thermal curing step and a thermal post-curing step.

Because Eichelberger fails to disclose thermally curing the heating element for a first period of time in a standard curing cycle, followed by applying a dielectric layer and thermally curing the heating element and dielectric layer for a second period of time that is longer than the first period of time, Applicants respectfully submit that Eichelberger fails to teach each and every element of the present invention, as set forth in claim 14. Accordingly, Applicants respectfully submit that independent claim 14, as well as claims 16-17, 20, 25, and 26 dependent therefrom, are in condition for allowance, for at least these reasons. Therefore, reconsideration and withdrawal of the rejection is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 18, 19, and 21-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Eichelberger in view of U.S. Pat. No. 3,934,119 issued to Trenkler (Trenkler). Applicants respectfully traverse this rejection.

BRINK
HOFFER
GILSON
ALONE

-10-

Appln. No. 09/681,891

Attorney Docket No. 13378-138

Claims 18, 19, and 21-24 depend from claim 14, which Applicants respectfully submit is patentable for the reasons given above. Therefore, Applicants respectfully submit that claims depending from claim 14, such as claims 18, 19, and 21-24, are also patentable, for at least these reasons.

New Claims

New claims 27-46 have been added.

Claim 27 is directed toward a thick film heater having a target object to be heated and a heating element having a polymer-based electrically thick film resistive circuit. The heating element is applied to a surface of the target object and thermally cured in a standard curing cycle for a first period of time. A dielectric layer is applied over the heating element, and the heating element and dielectric layer are thermally cured in a post-curing cycle for a second period of time that is longer than the first period of time.

Claim 27 is patentable for the reasons given above with reference to claim 14. Essentially, the art of record fails to disclose a heating element applied to a target object that is thermally cured in a standard curing cycle, followed by application of a dielectric layer and thermal curing in a post-curing cycle for a longer period of time than the standard curing cycle.

Claims 28-39 depend from Claim 27, and therefore Applicants respectfully submit that these claims are also patentable for the reasons given above.

Claims 40-46 depend from Claim 14, which is patentable for the reasons given above. Therefore, Applicants respectfully submit that claims 40-46 are also patentable, for at least these reasons.

ARINKO
HOFFER
GILSON
BLONDE

Appln. No. 09/681,891

Attorney Docket No. 13378-138

In view of the above, it is submitted that these new claims are allowable and such action is requested.

SUMMARY

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot, and that pending claims 14 and 16-46, as amended, are patentable. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned at (734) 302-6000.

Respectfully submitted,

8/29/2007

Date



Bonnie R. Shaw (Reg. No. 60,493)

BRINKS HOFER GILSON & LIONE
PO Box 10395
Chicago, IL 60610-5599

BRINKS
HOFER
GILSON
& LIONE

-12-